

applicant with the final Office Action. The applicant respectfully requests that the references listed on sheet 1 of 10 of the Forms 1449 be considered by the Examiner. Pursuant to the provisions of MPEP 609, the applicant requests that a copy of sheet 1 of 10 of the Forms 1449, initialed as being considered by the Examiner, be returned to the applicant with the next official communication.

#### *Rejection of Claims Under §102*

Claim 40 was rejected under 35 USC § 102(e) as being anticipated by Forbes et al. (U.S. Patent No. 5,989,958, Forbes). Claim 40 has been cancelled without prejudice.

#### *Rejections of Claims Under §103*

Claim 40 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara (U.S. Patent No. 5,798,548) in view of Weitzel et al. (U.S. Patent No. 5,661,312, Weitzel) and Hamakawa et al. (JP 357126175A, Hamakawa). Claim 40 has been cancelled without prejudice.

Claims 36 and 37 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara in view of Weitzel and Hamakawa. The applicant respectfully traverses.

The MPEP states the following with regard to rejections under 35 USC § 103:

“To establish a *prima facie* case of obviousness ... there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.” MPEP 2143. A Federal Circuit opinion states that the suggestion or motivation to combine references must be found in the prior art. MPEP 2143 citing *In re Vaeck*, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991).

The final Office Action found motivation to combine Fujiwara and Weitzel from the statement in Weitzel that “[t]he increased depletion region width improves the breakdown voltage.” Weitzel, Abstract. However, this advantage arises from the breakdown enhancement layer 20, not the gates 18. Weitzel says “a breakdown enhancement layer 20 on layer 12 is used to improve the gate-to-drain breakdown voltage of transistor 10.” Weitzel, column 1, lines 46-48. Weitzel recites several possible gate materials such as silicon carbide in column 1, lines 61-

64, but does not provide a motivation for substituting a silicon carbide gate into the structure of Fujiwara.

The final Office Action cited “high electronic conversion efficiency” as the motivation for combining Hamakawa with Fujiwara and Weitzel. Hamakawa does state its purpose is to “obtain high optoelectric conversion efficiency when a heterojunction optoelectric element is to be formed.” Hamakawa, Abstract. However, this is not a suggestion to modify Fujiwara or Weitzel because neither Fujiwara nor Weitzel is described as an optoelectric element or a heterojunction. Heterojunctions are a special class of semiconductor devices. The final Office Action has not identified a suggestion in the prior art for adding a part of the heterojunction optoelectric element of Hamakawa to the structures of either Fujiwara or Weitzel.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 36 and 37 has **not** been established in the final Office Action, and that claims 36 and 37 are in condition for allowance.

Claims 41-44 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara in view of Miyawaki (U.S. Patent No. 5,808,336). Claims 41-44 have been cancelled without prejudice.

Claims 36-39 were rejected under 35 USC § 103(a) as being unpatentable over Weitzel in view of Hamakawa. The applicant respectfully traverses.

The Federal Circuit, in *In re Lee*, 61 USPQ2d 1430 (Fed. Cir. 2002), requires that the suggestion or motivation to combine references “be based on objective evidence of record.” The Federal Circuit also indicated that the suggestion or motivation must be specific. 61 USPQ2d at 1433. Another Federal Circuit opinion says that there must be a “clear and particular” showing of a “teaching or motivation to combine prior art references.” *In re Dembiczaik*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). The Federal Circuit also said that “[b]road conclusory statements regarding the teaching of multiple references, standing alone, are not “evidence.”” 50 USPQ2d at 1617.

The final Office Action discusses many reasons for combining Weitzel and Hamakawa. For example, the final Office Action states that “[r]esistivity and reflectivity are related, as

shown by the well-known Kramers-Kronig relations” and “[o]bviously, a lower electron affinity is the cause of the improvement of said photoelectric conversion efficiency.” Final Office Action, page 11. Neither of these statements is supported by evidence in the prior art. The multiple and diverse statements of motivation for the combination, some without support in the prior art, do not together form a clear and particular showing of a suggestion to combine Weitzel and Hamakawa as is required by *In re Dembiczak*.

With reference to the discussion of claims 36 and 37 above, the final Office Action has also not identified a suggestion in the prior art for adding a part of a heterojunction optoelectric element to the structure of Weitzel which is not described as a heterojunction optoelectric element.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 36-39 has **not** been established in the final Office Action, and that claims 36-39 are in condition for allowance.

Claim 45 was rejected under 35 USC § 103(a) as being unpatentable over Weitzel, Hamakawa, and Shrivastava et al. (U.S. Patent No. 5,557,122, Shrivastava). Claim 45 has been cancelled without prejudice.

Claims 56-57 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara in view of Weitzel and Hamakawa. Claims 56 and 57 have been cancelled without prejudice.

Claim 58 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Weitzel, Hamakawa, and Shrivastava. Claim 58 has been cancelled without prejudice.

Claim 59 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara in view of Weitzel and Hamakawa. The applicant respectfully traverses.

The final Office Action has not identified suggestions in the prior art for the combination of Fujiwara, Weitzel, and Hamakawa as discussed above with respect to claims 36 and 37. The applicant respectfully submits that a *prima facie* case of obviousness of claim 59 has **not** been established in the final Office Action, and that claim 59 is in condition for allowance.

Claims 60-61 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Weitzel, Hamakawa, and Miyawaki. The applicant respectfully traverses.

The final Office Action has not identified suggestions in the prior art for the combination of Fujiwara, Weitzel, and Hamakawa as discussed above with respect to claims 36 and 37, and the rejection of claims 60-61 has not provided such a suggestion. The applicant respectfully submits that a *prima facie* case of obviousness of claims 60-61 has **not** been established in the final Office Action, and that claims 60-61 are in condition for allowance.

Claims 62 and 65 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara in view of Halvis et al. (US 5,369,040, Halvis). The applicant respectfully traverses.

The final Office Action has not referred to specific text in Fujiwara or Halvis to find a suggestion for their combination. For example, the final Office Action states that “[t]he inventions by Fujiwara and Halvis et al can be combined as nothing else would have to be modified in the basic transistor design” and “[t]he motivation for lowering the carbon content stems from the cost of introducing the carbon.” Final Office Action, page 16. There is no cited support for these statements in the prior art as is required by *In re Vaeck*.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 62 and 65 has **not** been established in the final Office Action, and that claims 62 and 65 are in condition for allowance.

Claims 63-64 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Halvis, and Miyawaki. Claims 66-67 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Halvis, and Miyawaki. The applicant respectfully traverses.

As discussed above with respect to claims 62 and 65, the final Office Action has not identified suggestions in the prior art for the combination of Fujiwara and Halvis. The final Office Action also has not referred to specific material in Miyawaki to find a suggestion for the combination of Fujiwara and Halvis.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 63-64 and 66-67 has **not** been established in the final Office Action, and that claims 63-64 and 66-67 are in condition for allowance.

Claim 68 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara in view of Weitzel and Hamakawa, or in view of Halvis. Claim 68 has been cancelled without prejudice.

Claim 69 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara and Halvis or over Fujiwara, Weitzel, Hamakawa, and Miyawaki. Claim 69 has been cancelled without prejudice.

Claim 70 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Halvis, and Miyawaki, or over Fujiwara, Weitzel, Hamakawa, Miyawaki, and Shrivastava. Claim 70 has been cancelled without prejudice.

Claims 71, 80, and 83 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara in view of Weitzel and Hamakawa. The applicant respectfully traverses.

As discussed above with respect to claims 36 and 37, the final Office Action has not identified suggestions in the prior art for the combination of Fujiwara, Weitzel, and Hamakawa.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 71, 80, and 83 has **not** been established in the final Office Action, and that claims 71, 80, and 83 are in condition for allowance

Claims 72-73, 81-82, and 84-85 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Weitzel and Hamakawa, and further in view of Miyawaki. The applicant respectfully traverses.

As discussed above with respect to claims 36 and 37, the final Office Action has not identified suggestions in the prior art for the combination of Fujiwara, Weitzel, and Hamakawa. The final Office Action also has not referred to specific text or other material in the prior art to

find a suggestion for the combination of Fujiwara, Weitzel, and Hamakawa with Miyawaki as is required by *In re Lee*.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 72-73, 81-82, and 84-85 has **not** been established in the final Office Action, and that claims 72-73, 81-82, and 84-85 are in condition for allowance.

Claims 74, 76-77, and 79 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara in view of Halvis. The applicant respectfully traverses.

As discussed above with respect to the rejection of claims 62 and 65, the final Office Action has not referred to specific text or other material in the prior art to find a suggestion for the combination of Fujiwara and Halvis as is required by *In re Lee*.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 74, 76-77, and 79 has **not** been established in the final Office Action, and that claims 74, 76-77, and 79 are in condition for allowance.

Claims 76 and 79 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara and Halvis, and further in view of Shrivastava. The applicant respectfully traverses.

As discussed above with respect to the rejections of claims 62 and 65, the final Office Action has not referred to specific text or other material in the prior art to find a suggestion for the combination of Fujiwara and Halvis as is required by *In re Lee*. The final Office Action has also not provided a suggestion for the combination of Fujiwara and Halvis with any material from Shrivastava.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 76 and 79 has **not** been established in the final Office Action, and that claims 76 and 79 are in condition for allowance.

Claims 75 and 78 were rejected under 35 USC § 103(a) as being unpatentable over Fujiwara and Halvis, and further in view of Miyawaki.

As discussed above with respect to the rejections of claims 62 and 65, the final Office Action has not referred to specific text or other material in the prior art to find a suggestion for

**AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE**

Serial Number: 09/691004

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Title: TRANSISTOR WITH VARIABLE ELECTRON AFFINITY GATE AND METHODS OF FABRICATION AND USE

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the combination of Fujiwara and Halvis as is required by *In re Lee*. The final Office Action has also not provided a suggestion for the combination of Fujiwara and Halvis with any material from Miyawaki.

The applicant respectfully submits that a *prima facie* case of obviousness of claims 75 and 78 has **not** been established in the final Office Action, and that claims 75 and 78 are in condition for allowance.

Claim 98 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Weitzel, Hamakawa, and Miyawaki.

As discussed above with respect to claim 36, the final Office Action has not identified suggestions in the prior art for the combination of Fujiwara, Weitzel, and Hamakawa. The final Office Action has also not provided a suggestion for the combination of Fujiwara, Weitzel, and Hamakawa with any material from Miyawaki.

The applicant respectfully submits that a *prima facie* case of obviousness of claim 98 has **not** been established in the final Office Action, and that claim 98 is in condition for allowance.

Claim 99 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Weitzel, Hamakawa, Miyawaki, and Shrivastava.

As discussed above with respect to claim 37, the final Office Action has not identified suggestions in the prior art for the combination of Fujiwara, Weitzel, and Hamakawa. The final Office Action has also not provided a suggestion for the combination of Fujiwara, Weitzel, and Hamakawa with any material from Miyawaki or Shrivastava.

The applicant respectfully submits that a *prima facie* case of obviousness of claim 99 has **not** been established in the final Office Action, and that claim 99 is in condition for allowance.

Claim 100 was rejected under 35 USC § 103(a) as being unpatentable over Fujiwara, Weitzel, and Hamakawa, and further in view of Miyawaki and Shrivastava. . Claim 100 has been cancelled without prejudice.

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**CONCLUSION**

The applicant respectfully submits that all of the pending claims are in condition for allowance, and such action is earnestly solicited. The Examiner is invited to telephone the below-signed attorney at 612-373-6973 to discuss any questions which may remain with respect to the present application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

LEONARD FORBES ET AL.

By their Representatives,

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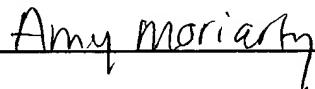
Date 31 JANUARY 2003

By \_\_\_\_\_

Robert E. Mates  
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Name



Signature



CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Box AF, Commissioner of Patents, Washington, D.C. 20231, on this 31st day of January, 2003.